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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/762,237	01/23/2004	Takemori Takayama	KOM-0153/INO/DIV 3	5466

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EXAMINER	
SAVAGE, JASON L	
ART UNIT	**PAPER NUMBER**
1775	

DATE MAILED: 03/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/762,237	TAKAYAMA ET AL.	
	Examiner	Art Unit	
	Jason L Savage	1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *7-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 10/193,625.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/23/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 7-10 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Takayama'549 et al (US 5,948,549).

Takayama'549 teaches a copper based sintered contact material which is sinter bonded to an iron-base material (col. 1, ln. 7-11). Takayama'549 further teaches the contact may be a CuSn alloy which contains multiple materials capable of forming intermetallics (col. 11, Table 4). Takayama'549 teaches the inclusion of many of the elements from Applicant's claimed first group of elements capable of forming an intermetallics including Ni, Si, Co, Al and P (Table 4 and Col. 8, ln. 1-7). Takayama'549 also teaches many of the elements from the claimed second group intermetallic forming elements including Cu, Sn, Mn, Cr, Mo and W (Table 4 and Col. 8, ln. 9-13).

Takayama'549 further exemplifies an embodiment wherein a contact contains elements capable of forming a first intermetallic of NiSi and a second intermetallic of SnMn wherein the total amount of intermetallic compound is 10% by weight (Table 4, Nos. 24-25). Although 10% by weight is not the same as 10% by volume they both

measure the relative amounts of each material. Absent the criticality of the volume % being 10% or less as opposed to the weight % being 10% or less, it would not provide a patentable distinction over the prior art since it is not clear how the two resultant products would differ.

Furthermore, while the specific embodiments recited above may be right at or just outside of the range of intermetallic content recited in the claims, Takayama'549 teaches that the amounts of each element can vary greatly such as the Ti content may be a little as 0.2 wt%, Si and Al contents may be as little as 0.1 wt% to 3.0 wt% (col. 9, ln. 62-67). The Ni content may be as low as 0.5 wt% (col. 13, ln. 20-39). It would have been within the level of one of ordinary skill in the art to have recognized that alternate amounts of the elements could have been added to the contact with a reasonable expectation of success since Takayama'549 teaches a variety of ranges for each of the elements may be used in the contact. Once again, absent a teaching of the criticality of the volume % of the intermetallics being less than 10, it would not provide a patentable distinction over the prior art since one could have produced a contact meeting the claim limitation simply by following the teachings of Takayama'549 wherein the minimum amounts disclosed for each element were used instead.

Regarding claim 8, Takayama'549 teaches that non-metallic particles may be contained in the contact including oxides (col. 5, Table 1, No. 20-26). While Takayama'549 teaches the non-metallic particle content in wt%, it is the position of the Examiner that a wt% of 1.5 or less would equate to a volume % of less than 4 % since the amount of material is directly correlated to the volume it would occupy.

Regarding claim 9, Takayama'549 teaches that Mo, Co, Fe may be dispersed in an amount within the range claimed by Applicant (col. 7, Table 2, No. 8-10 and 14).

Regarding claim 10, Takayama'549 teaches that graphite may be contained in an amount less than 1 wt% (col. 5, Table 1, No 14-15).

Regarding claim 12, Takayama'549 teaches that the contact contain roughly 10% Sn and 5% Pb (col. 7, Table 2, No 1-14).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 7-10 and 12-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takayama'549 (US 5,948,549) in view of Takayama'121 et al (US 6,613,121).

Takayama'549 teaches a copper based sintered contact material which is sinter bonded to an iron-base material (col. 1, ln. 7-11). Takayama'549 further teaches the contact may be a CuSn alloy which contains multiple materials capable of forming intermetallics (col. 11, Table 4). Takayama'549 teaches the inclusion of many of the elements from Applicant's claimed first group of elements capable of forming an intermetallics including Ni, Si, Co, Al and P (Table 4 and Col. 8, ln. 1-7). Takayama'549

also teaches many of the elements from the claimed second group intermetallic forming elements including Cu, Sn, Mn, Cr, Mo and W (Table 4 and Col. 8, ln. 9-13).

Takayama'549 further exemplifies an embodiment wherein a contact contains elements capable of forming a first intermetallic of NiSi and a second intermetallic of SnMn wherein the total amount of intermetallic compound is 10% by weight (Table 4, Nos. 24-25).

However, Takayama'549 is silent as to the volume % of intermetallics in the contact. Takayama'121 teaches that a copper based sintered contact material wherein the properties of the contact material can be optimized by controlling the dispersion of the intermetallic compounds by controlling the wt% of the intermetallic materials in the contact (col. 9, ln. 43-49). Takayama'121 further teaches that depending upon the intended use of the contact material, the optimal volume % of the intermetallics can vary from 0.2 to 35 volume% (col. 9, ln. 43-64).

It would have been obvious to one of ordinary skill in the art to have applied the teaching of Takayama'121 of controlling the volume % dispersion of the intermetallic materials when forming the contact of Takayama'549 containing multiple intermetallic forming materials. One would have been motivated to do so in order to optimize the properties, such as the wear resistance, of the contact of Takayama'549.

Regarding claim 8, Takayama'549 teaches that non-metallic particles may be contained in the contact including oxides (col. 5, Table 1, No. 20-26). While Takayama'549 teaches the non-metallic particle content in wt%, it is the position of the

Examiner that a wt% of 1.5 or less would equate to a volume % of less than 4 % since the amount of material is directly correlated to the volume it would occupy.

Regarding claim 9, Takayama'549 teaches that Mo, Co, Fe may be dispersed in an amount within the range claimed by Applicant (col. 7, Table 2, No. 8-10 and 14).

Regarding claim 10, Takayama'549 teaches that graphite may be contained in an amount less than 1 wt% (col. 5, Table 1, No 14-15).

Regarding claim 12, Takayama'549 teaches that the contact contain roughly 10% Sn and 5% Pb (col. 7, Table 2, No 1-14).

Regarding claim 13, Takayama'549 teaches what is set forth above but teaches a Sn content of up to 10 wt% as opposed to the claimed range of 12-16 wt%. Takayama'121 teaches that a copper contact containing up 12 wt% Sn may exhibit improved sinterability, particularly with regard to Cu-Al alloys (col. 5, ln. 60 – col. 6, ln. 2). Since Takayama'549 teaches the use of many Al containing copper alloys, it would have been obvious to one of ordinary skill upon reading the teaching of Takayama'121 that even higher Sn contents than what is exemplified in Takayama'549 may produce beneficial effects when sintering the copper contact.

Regarding the limitation that a Cu-Sn compound phase is dispersedly precipitated in the structure thereof, Takayama'549 specifically recites that a Cu-Sn compound alloy is added when forming the contact material and as such, one would reasonably expect precipitated Cu-Sn structures to be contained within the contact.

Regarding claims 14 and 19, Takayama'549 teaches that other elements such as Mn, Be and Ag may be added to the contact material (col. 16, ln. 17-60), although it is

silent to the addition of lubricating particles such as those claimed. Takayama'121 teaches that solid lubricating particles including various fluorides can be used as well as S containing materials in order to positively affect the hardness and sinterability as well as improving the resistance to seizure of the sintered contact (col. 8, ln. 24-29). It would have been obvious to one of ordinary skill in the art to have recognized that solid lubricating materials including those claimed by Applicant could be added to the contact of Takayama'549 in order to positively affect the properties of the contact material.

Regarding claim 15, Takayama'549 is silent to the sintered contact being a double-layered contact however, as is evidence by Takayama'121, sintered double-layered contacts are structure that are well known in the art (col. 1, ln. 53-67). Absent a teaching of the criticality of the contact being a double-layered contact, it would not provide a patentable distinction over the prior art since it would have been within the level of one of ordinary skill in the art to have formed the contact of Takayama'549 into any known contact structure, including a double-layered contact, with a reasonable expectation of success.

Regarding claim 16, Takayama'549 teaches that P is preferably contained in an amount of 0.1 to 1.0 wt% (col. 8, ln. 1-8). Takayama'549 further teaches that other elements such as Cr, Si, Al and Ti may be added as well (col. 10, ln. 1 – col. 10, ln. 25).

Regarding claim 17, the non-metallic particles disclosed by Takayama'549 would restrain shrinkage of the sintered layer just as much as the non-metallic particles claimed by Applicant.

Regarding claim 18, Takayama'549 teaches the addition of CuSn containing greater than 30 wt% Sn (col. 14, ln. 44-61). Takayama'549 also teaches the addition of Sn primary powder (col. 11, Table 4, No 18-25). It would have been obvious to have used both the High Sn containing copper and primary Sn powder since Takayama'549 teaches both are suitable for use.

5. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takayama'549 et al (US 5,948,549) as evidenced by Takayama'775 (US 6,015,775).

Takayama'549 teaches a copper based sintered contact material containing a variety of materials including graphite; however it is silent to the particle size of the graphite materials. Takayama'775 teaches a copper based sintered contact material (col. 4, ln. 15-23) which may contain solid lubricant particles such as graphite (col. 3, ln. 16-47). Takayama'775 further teaches that the particle size of the solid lubricant particles may be between 100 and 3000 μm (col. 3, ln. 17-29). Although Takayama'775 teaches that the solid lubricants are intended to protrude from the contact surface in order to provide a self-lubricating sintered sliding member whereas Takayama'549 is silent to the positioning of the particles, Takayama'775 is merely being provided as evidence that the use of solid lubricant particles having sizes within the range claimed is known in the art.

In response to the issue whether the reference is nonanalagous art, it has been held that the determination that a reference is from a nonanalogous art is twofold. First, one decides if the reference is within the field of the inventor's endeavor. If it is not, one

proceeds to determine whether the reference is reasonably pertinent to the particular problem with which the inventor was involved, In re Wood, 202 USPQ 171, 174. In the instant case, both Takayama'549 and Takayama'775 are generally drawn to copper based sintered contact materials containing solid lubricant particles. Absent a teaching of the criticality of the particles being within the range claimed by Applicant, it does not provide a patentable distinction over the prior art since the use of solid particles having a size of less than 200 μm is known and would have been an obvious design choice to one of ordinary skill in the art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason L Savage whose telephone number is 571-272-1542. The examiner can normally be reached on M-F 6:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on 571-272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jason Savage
3-4-05

DEBORAH JONES
SUPERVISORY PATENT EXAMINER